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Assessment Of New Zealand's Individual Transferable Quota Fisheries Management

Economic and Commercial Analysis

Report No. 75

Fisheries and Oceans Pêches et Océans

Canada

Assessment Of New Zealand's

Individual Transferable Quota Fisheries Management

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ABSTRACT

Macgillivray, P.B. 1990. Assessment of New Zealand's individual transferable quota fisheries management. Econ. Comm. Anal. Rep. No. 75, Department of Fisheries and Oceans: 19 p.

The majority of New Zealand's fisheries came under individual transferable quota (ITQ) management during the 1980s resulting in fundamental changes for the fishing industry and the fisheries management agency. Overall, there is strong support for ITQs within New Zealand and a belief that the benefits of ITQ management outweigh the problems. This view is shared by government and industry. New Zealand's experience provides a number of valuable lessons for other countries interested in ITQ management.

1. INTRODUCTION

1.1 Purpose

The purpose of this paper is to assess the performance of New Zealand's individual transferable quota (ITQ) management. The majority of New Zealand's fisheries came under ITQ management during the 1980s resulting in fundamental changes for both the fishing industry and the fisheries management agency. Lessons learned from New Zealand's experience with ITQs provide some valuable insights which can help Canada in the design and implementation of ITQs in fisheries that are amenable to such management.

1.2 Background

Before the declaration of the 200 mile exclusive economic zone (EEZ) in 1978, New Zealand's fishery was essentially a small domestic inshore industry. Like most fishing nations, New Zealand's fisheries management was primarily concerned with protecting stocks from overfishing. A variety of input controls were employed over the years to conserve the fisheries resource including, fishing seasons, closed fishing areas, gear restrictions and limiting the number of fishing boats.[1]

In the 1980s, economic objectives began to influence fisheries management policy. The concern for economic objectives was reflected in the Fisheries Act of 1983. "For the first time in New Zealand fishing history, recognition was given not only to biological objectives but also to the goal of encouraging maximal return from the fishery. The act did not, however, address the fundamental question of how economic goals could be meshed with goals of biological conservation, since the latter were traditionally attended by a complex of regulatory controls."[2] The first indication came with the introduction of an economics based enterprise allocation (EA) management system for the deepwater fishery in which individual company quotas were allocated. Individual quotas represented a significant departure from traditional management measures (i.e. input controls). However, the transition was fairly smooth since New Zealand companies were just establishing themselves in the offshore fishery.[3]

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[1] For a more detailed historical review of fisheries management in New Zealand refer to Clark and Duncan, 1986.

[2] Clark, I.N., P.J. Majors, and N. Mollett. 1988. Development and Implementation of New Zealand's ITQ Management System. Marine Resource Economics, Volume 5, Number 4. pp. 326.

[3] Before the declaration of the 200 mile EEZ, the deepwater fishery was heavily exploited by foreign fishing nations. Between 1978 and 1983 a policy of limited domestic expansion, joint venture arrangements and licensing foreign fleets was applied to the zone outside 12 miles.

The adoption of individual company quotas in the deepwater fishery was followed three years later, in 1986, by the introduction of a similar system of ITQs in the inshore fishery. The inshore fishery was a traditional New Zealand industry and the transition from input controls to ITQs was more eventful than that experienced in the deepwater fishery. The balance of this paper deals largely with the inshore fishery.

1.3 Events Leading Up To The Implementation Of ITQs

In the early 1980s, the inshore fishery was "showing signs of fundamental economic and biological problems."[4] Initially, the government responded in the traditional way -- restricting fishing effort. For example, between 1978 and 1982, moratoriums on new entrants to all the significant inshore fisheries were put in place. Next, during 1983 and 1984 many part time inshore fishermen were eliminated from the fishery by a policy of renewing fishing permits only for individuals making 80 percent or more of their income or $10,000 a year from the fishery. These measures had a negligible effect on fishing effort and catch.

In 1984, the government decided that ITQs held the greatest potential for solving the biological and economic problems of the inshore fishery. The significance of economic objectives in connection with an ITQ proposal was evident in government documents.

> "The Government believes that the fisheries resources should be managed for the best long term benefit of New Zealand. Merely to protect the fish stocks without consideration of the economics of the industry or the plight of individual fishermen would not be compatible with that aim."[5]

Recognizing that support from the fishing industry was the key to successful implementation of ITQs, a great deal of effort was devoted to "selling" ITQs. This involved the preparation of background material, meetings with key industry leaders and an extensive round of public hearings (i.e. about 65 meetings).
The hearings were used by government to inform the industry and the public of proposed management changes and to get comments which could be used to refine and develop the management program. At the hearings three options were presented:

Option 1 - No major changes to management except perhaps further entry limitations and vessel, gear, method and area restrictions.

Option 2 - Introduce TACs to restrict catches from stressed stocks to the sustainable yields. TACs would be fished competitively.

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[4] Clark, I.N., and A.J. Duncan. 1986. New Zealand's Fisheries Management Policies - Past, Present and Future: The Implementation of an ITQ-Based Management System. In N.Mollett (ed.), Fishery Access Control Programs Worldwide. Fairbanks: University of Alaska Sea Grant College Program. pp. 109.

[5] New Zealand Ministry of Agriculture and Fisheries, Inshore Finfish: Proposed Policy For Future Management. 1984. pp. 9

Option 3 - Introduce ITQs in addition to TACs with some financial assistance from government to compensate fishermen for reduced catches.

The government was firmly committed to Option 3 and this was evident throughout the consultative process. "The consultation procedure was weighted in favor of the ITQ policy. It did cover other management mechanisms, but more by way of considering and rejecting them than by promoting them as alternatives."[6] Also, the government made it clear that no financial assistance would be considered unless there was a "high level of support, co-operation, and involvement from industry in the proposed policy."[7]

Through the public hearings fishermen expressed a number of concerns about the ITQ proposal. The major concerns involved the initial allocation of quota, the ability of government to monitor landings and control dumping at sea, and a fear that companies would use quotas to gain control of the fishery. In addition, the New Zealand fishing industry was " by nature conservative and relatively resistant to change. Fishers perceive themselves as independent, free, individualistic -- as hunters."[8]

Despite the specific concerns and the conservative nature of the industry a majority of fishermen favored ITQs. Several factors contributed to this support.

Financial Assistance - Catches in several inshore fisheries were going to be reduced because of the concern about overfishing. Reductions in catch would be achieved by either more effort controls or TACs. The ITQ option was the only one that provided financial assistance to accompany the reduction in catch. "Some fishers expressed the view that they were being presented no real choice, that the consultation process was more an exercise in blackmail than anything else, and that if they did not go along with the ITQ proposal they would be forced out of business."[9]

Success of the Deepwater EA Program - Some of the fishing companies involved in the deepwater fishery were also major players in the inshore fisheries. Their experience with company quotas in the deepwater fishery led them to support the ITQ proposal for the inshore fishery.

Support of Key Industry Leaders - Before the public meetings, the merits of ITQs were discussed with several industry leaders (e.g. leaders of the Federation of Commercial Fishermen). Their involvement in public consultation helped gain more general support for ITQs.

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[6] Clark and Duncan. 1986. pp. 131.

[7] New Zealand Ministry of Agriculture and Fisheries, Inshore Finfish: Proposed Policy For Future Management. 1984. pp. 9.

[8] Clark and Duncan. 1986. pp. 130.

[9] Clark and Duncan. 1986. pp. 131.

Value Associated With ITQs - ITQs gave fishermen equity in the resource which was reflected in the trading value of quota. This was particularly important in New Zealand since many fishing permits were not transferable and therefore had no trading value. The value of ITQ was very attractive to those receiving initial allocations.

Government Commitment to Economic Reform - The Government's concern for economic efficiency in the fishing industry was not an isolated initiative but rather it was part of a general move to overhaul of the New Zealand economy. Faced with a large foreign debt and high inflation a new Government was elected in 1984 and set out to overcome what it believed were the root causes of the country's economic problems -- protective trade barriers, subsidies and a large debt. To correct this situation the government launched a broad range of economic reforms designed to expose New Zealand businesses more directly to world market forces and reduce the public debt. These measures included a reduction in financial assistance going to the agriculture industry, the removal of import licensing, a reduction in tariffs, the removal of exchange controls, the sale of crown corporations, and a move to recover the cost of government services (i.e. user fees). The fact that ITQs were consistent with the governments economic reform strategy provided the political will to see such major changes occur in the fishing industry.

The balance of this paper describes the New Zealand ITQ management system and its performance to date. Specifically, Section 2 briefly describes the key features of the ITQ management system. An assessment of the programs performance is contained in Section 3. Section 4 suggests lessons for Canada which are drawn from New Zealand's experience with ITQs. Finally, conclusions are presented in Section 5.

2. DESCRIPTION OF NEW ZEALAND'S ITQ MANAGEMENT

2.1 Features of the ITQ Program

An ITQ is defined as the right to catch a specific quantity of fish each year from a certain area. From a constitutional and legal standpoint it is important to note that an ITQ is a harvesting right, not a property right. This distinction has its roots in the fact that New Zealand manages but does not own the living marine resources of its 200-mile EEZ. If New Zealand is unable to harvest the surplus fish in the EEZ, it must make the surplus available to foreign nations.

The key features of the ITQ program are described below:

Total Allowable Catches (TACs) Established - TACs were set for the major inshore finfish species in each of nine fishery management areas. TACs for stressed inshore species were set between 25 percent and 75 percent lower than 1983 catch levels.

Initial Allocation - TACs for the commercial fishery were allocated among fishing vessel owners on the basis of vessel catch history (i.e. the average of the best two years catch by the vessel over the period October 1981 to September 1984). These allocations or ITQs were expressed as a fixed number of tonnes of fish rather than a percentage of TAC.

ITQ Appeals - Where allocation on the basis of catch history was considered inequitable there was a right of objection. There were two general grounds for objections. First, errors in government catch records and second, special circumstances, such as illness or vessel breakdown, that made it inappropriate to use vessel catch history as the basis for assigning ITQ.

Government Buyback of Quota - ITQs were implemented at a time when the catch of many stocks was being reduced. The imbalance between fleet capacity and available catch had the potential to be a major impediment to the introduction of ITQs. General support for the program would be difficult to obtain if allocations were substantially below recent catch levels. Also, fishermen would be under economic pressure to catch more than their quota. Therefore, in instances where the sum of ITQs allocated to fishermen exceeded the TAC available to be caught, the government reduced ITQ holdings to match the TAC through a voluntary quota buyback program. However, the target reductions were not achieved for a number of species, and administrative cuts were prorated over the remaining quota holders. Quota holders were provided a legislative guarantee that in the event that fish stocks recover, their administrative cuts would be restored.

TAC Adjustments - Any subsequent changes in TAC were to be made by the government buying or selling quota.

Transferability - Transferability was considered a crucial element in the ITQ system and few restrictions were placed on quota transfers. For example, quota can be leased or sold in perpetuity or for a fixed term. The minimum quantity that can be traded is 100 kg. At the request of the fishing industry, foreign ownership of quota is prohibited and no person or company can own more than 20 percent of a species TAC. A quota exchange was established to facilitate trading, although face-to-face trades are permitted. To be legal all transactions must be registered.

Resource Rentals - A resource rental is an annual payment per tonne of ITQ. Resource rentals are paid on all quota holdings, even if the quota is not fished. When ITQs were introduced, minimal resource rentals were set on most species in order to establish the principle, but at the same time the government stated its intention to move progressively to capture most if not all of the economic rent. The main criteria established for adjusting resource rentals were the value of ITQ for the species or class of fish, the net returns or likely net returns to commercial fishermen for fish caught and any relevant changes in TACs.

Enforcement - Enforcement activities changed considerably with the introduction of ITQs. Before ITQ management, New Zealand used a standard game warden approach. Under ITQs "the new role of enforcement authorities is not so much policing fishermen as monitoring, following product flow, seeking to establish a paper trail from the fishing vessel to retail disposal."[10]

2.2 Changes To The Original ITQ Program

There have been several changes to the ITQ management system since it became fully effective on October 1, 1986. The most significant changes are described below.

Extension of ITQs to Other Species - On October 1, 1987 three additional species -- paua, squid and mackerel -- came under ITQ management. This brought the total number of species covered by ITQs to thirty-two, including eight deepwater species.

Measures to Deal With Bycatch - Ongoing efforts have been made to deal with bycatch problems (i.e. fishermen unavoidably catching some fish of a species for which he does not hold quota and subsequently dumping the bycatch). Originally, two features of the ITQ program were intended to minimize bycatch dumping. First, since quotas are transferable individuals could adjust their quota holdings in accordance with their catch. Second, fishermen were allowed to surrender catch in excess of quota to the government. Additional measures to reduce bycatch dumping include the ability to use ITQ for a target species to cover a bycatch species. The list of species involved is limited and this trade-off system is not widely used. Also, the government is attempting to establish a realistic surrender price that will encourage fishermen to land fish caught in excess of their ITQ but will discourage targeting on bycatch.

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[10] Clark, Majors, and Mollett. 1988. pp. 334.

ITQ Entitlement - ITQs which were initially allocated as a fixed number of tonnes were switched to percentage shares of the TAC in 1989. As a result, the government does not have to buy or sell quota to adjust TACs as stock conditions change.

Resource Rentals - In 1989, negotiations between the Ministry of Agriculture and Fisheries (MAF) and the New Zealand Fishing Industry Board resulted in resource rentals for most species being maintained at October, 1989 levels (plus inflation) for five years. The moratorium on resource rental increases was part of a deal which saw the ITQ entitlement switch from tonnage to a percentage of the TAC.

3. ASSESSMENT OF NEW ZEALAND'S ITQ MANAGEMENT

The introduction of ITQs in New Zealand required major changes in the operations of both the fishing industry and the Ministry of Agriculture and Fisheries (MAF). Overall, there is strong support for ITQs and a belief that the benefits of ITQs outweigh the problems. However, some individuals in the industry and MAF are critical of specific aspects of ITQ management. Within MAF, the area of most concern was biological management. Industry representatives were concerned about some aspects of biological management as well as enforcement and resource rentals.

The following assessment of ITQs deals with four main areas of concern -- biological management, economic performance, equity and administrative/enforcement considerations. Data were not generally available to enable a quantitative assessment of many ITQ impacts. Therefore, the assessment is based primarily on the observations of fishing industry representatives and MAF employees during the period November, 1988 to February, 1989. In addition, the assessment draws on a variety of papers referenced in the bibliography.

3.1 Biological Management

The majority of fishing industry representatives and MAF employees interviewed believe that ITQ management is helping to protect fish stocks from overfishing. In particular, the reduced catch of northern snapper was cited as an example of ITQs successfully addressing the overfishing problem. Much of the credit for dealing with overfishing went to the establishment of TACs rather than to individual allocations.

Although the majority of those interviewed believe that ITQs are helping to protect stocks from overfishing, several people felt that it is too early to judge ITQ management relative to biological management objectives (i.e. it will take many years to assess the long term impact of ITQs on stock abundance). In addition, there were a number of concerns raised about the impact of ITQs on biological management.

First, there was a lot of uncertainty about the credibility of TACs which were established to facilitate the implementation of ITQs. For many species, the information that was available was not adequate to conduct meaningful stock assessments. A MAF employee referred to ITQ management as an "information hungry system". But, much of the information required to set scientifically supported TACs was not available when ITQs were introduced. As a result, some TACs were based on average landings in recent years and some TACs (e.g. orange roughy and hoki) had to be significantly reduced within two years of being established.

Second, the existence of high grading and bycatch dumping was generally identified as a problem. "The most difficult area, as predicted, has been how to handle the bycatch problem."[11] Provisions described above (e.g. trading quota and surrendering catch in excess of quota) have not eliminated bycatch dumping. However, it is important to note that bycatch is not an issue in all fisheries. MAF researchers have examined the bycatch issue in some

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[11] Clark, Majors and Mollett. 1988. pp. 343.

detail and have concluded that "relatively few by-catch problems have been experienced in the largest fisheries ... during the first two years ... Most of the by-catch problems experienced thus far have been in localized inshore mixed species trawl fisheries."[12]

One processing sector representative was very concerned about bycatch dumping in the mixed species trawl fisheries. He expressed the view that ITQs create dumping problems because they attempt to impose a single species management system on a multispecies fishery. That is, it is impractical to catch the TAC for each species because TACs are set independently, based on maximum sustainable yield, and are inconsistent with harvesting practices which are often not species selective. He suggested that other objectives be established for setting TACs, recognizing bycatch problems (e.g. establish TACs that maximize the net revenue derived from the fishery) or alternatively, fewer species could be subject to TACs.

Industry representatives noted that high grading was common during the first season of ITQ management. However, many fishermen did not fulfill their quotas by the end of the season and began to recognize the additional costs associated with high grading. As a result, the extent of high grading was thought to be diminishing.

Third, some MAF officials and industry representatives were concerned that TAC reductions would be difficult to implement because they required the government to buy back excess ITQ. However, more flexibility to adjust TACs was achieved by expressing ITQs as a percentage of the annual TAC rather than absolute tonnage.

3.2 Economic Considerations

3.2.1 Industry Performance

ITQs are credited with improving the financial performance of the fishing industry. According to industry representatives, the most significant changes in fishing practices were undertaken to improve the quality and value of fish landings. These changes include the following:

a) some fishermen have switched from trawl to longline gear to increase the value of their catch (e.g. snapper caught on longline gear sometimes commands a price several times higher than the price of trawl caught snapper);

b) innovative on board handling methods and storage containers for individual fish have been used to access a lucrative Japanese export market;

c) fishing patterns have become market driven (i.e. recognizing changing demand conditions throughout the year); and,

d) trawl boats tend to land smaller quantities of fish per trip and handle the fish better.

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[12] Annala, J.H., K.J. Sullivan and A Hore. 1989. Management Of Multispecies Fisheries In New Zealand By Individual Transferable Quotas. pp. 6

The observations presented above are consistent with earlier research conducted in the Auckland region which found that "more than three-quarters (77%) of the industry were making substantial changes in their business because of ITQs. There were two types of changes: changing fishing methods and reducing costs and effort. Interviewees often stated that their changes in methods were aimed at maximizing the price received for fish landed and reducing costs."[13]

For vertically integrated companies, ITQs have taken much of the variability out of their supply of raw materials. This allows companies to optimize their use of capital.

Finally, under ITQ management fishermen are able to coordinate their various fishing activities more effectively and schedule fishing so as not to interfere with their other employment opportunities.

3.2.2 Government Costs and Revenues

ITQ management has had a significant impact on both government revenues and expenditures. However, before discussing the financial impact of ITQs on government coffers, one general observation is noteworthy. For several years prior to the introduction of ITQs, government costs associated with managing New Zealand's fisheries were roughly equal to the revenue collected from participants in the industry. The biggest single source of crown revenue came from access fees paid by foreign vessels fishing inside New Zealand's 200 mile exclusive economic zone. Refer to Table 1.

Two sources of revenue accompanied the introduction of ITQs -- crown quota sales and resource rentals. The sale (or lease) of quota by the crown occurred when TACs exceeded the quantity of fish initially allocated to fishermen. From 1986 to 1988 the sale and lease of crown quota generated over $85 million (New Zealand dollars). With the recent switch to basing ITQs on a percentage of the annual TAC rather than a fixed tonnage, this source of revenue will cease to exist. Resource rentals were the other new source of revenue. During the 1987/88 season, $12.5 million was generated by resource rentals. In the future, resource rentals will continue to be the major source of government revenue from the fishing industry.

The biggest increase in government costs associated with ITQs was the buyback of quota in stressed fisheries. The buyback cost about $46 million over the period 1986 to 1988. Buyback expenditures were devoted mainly to purchasing initial allocations of ITQ in excess of TACs. The switch to percentage ITQs will eliminate the need for future buybacks.

In addition to buyback expenditures, MAF incurred other startup costs. For example, enforcement costs increased during the short run by about 25 percent. The main factors contributing to the increase were layoffs of people whose skills were no longer needed, recruitment of auditors and investigators, the acquisition and programming of new computers and the increased number of fisheries observers.

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[13] Dewees, Christopher M. An Assessment of the Implementation of Individual Transferable Quotas in New Zealand's Inshore Fishery. Sea Grant Extension Program, University of California, Davis, California. pp. 13.

Table 1

Annual Revenues and Expenditures

(All values expressed in current $ NZ)

Ministry of Agriculture and Fisheries

	1984/85 ($000) Actual	1985/86 ($000) Actual	1986/87 ($000) Actual	1987/88 ($000) Actual	1988/89 ($000) Budget
REVENUE					
Quota Leases	0	0	0	3,373	2,000
Quota Sales	0	0	60,738	22,835	0
Resource Rentals	0	0	0	12,500	20,027
Foreign Access Fees	15,129	13,613	19,410	22,974	9,000
Deepwater Royalty	2,264	5,720	8,656	0	0
Other	745	3,185	2,306	3,204	3,686
Total Revenue	18,138	22,518	91,110	64,886	34,713
EXPENDITURE					
Personnel	9,951	11,406	14,647	16,623	18,557
Operating	5,928	7,085	8,995	10,701	13,592
Capital	662	782	2,486	538	2,166
MAFFish Operating	16,541	19,273	26,128	27,862	34,315
Buybacks	0	0	44,630	1,364	3,000
Other Assstance	2,509	715	486	1,567	74
MAFFish Grants	2,509	715	45,116	2,931	3,074
Total Expenditure	19,050	19,988	71,244	30,793	37,389
SURPLUS/(DEFICIT)	(912)	2,530	19,866	34,093	(2,676)

The ongoing cost of the ITQ management system is not expected to exceed the cost of the traditional game warden approach. In fact, MAF officials believe that enforcement of ITQs, with the focus on establishing a paper trail from the fishing vessel to the retail outlet, is more cost-effective than the previous system.

3.2.3 Resource Rentals

When ITQs were introduced, the government recognized that quota holders would be given preferential access to a public resource from which they would gain an economic benefit. This economic benefit could either be taxed away by the government or left in the fishery to be capitalized into the value of the ITQ. The New Zealand government considers it appropriate for those deriving an economic benefit to pay a rental to the original "owners" of the resource. However, annual increases in resource rentals have been very controversial and in 1989, MAF agreed to limit their increase for a five year period.

Aside from the obvious desire to keep resource rentals to minimum, industry representatives raised several concerns regarding the approach to setting them. First, the uncertainty over future resource rental levels creates an unstable business environment and makes it difficult to invest in quota. Second, if resource rentals increase too rapidly fishermen's commitment to ITQ management may be reduced, thereby making the system more difficult to administer. Third, resource rentals are viewed by the industry as a means of funding MAF activities (e.g. biological research) not as a means of contributing to the governments general revenue fund.

3.3 Equity

The main objectives of the ITQ management system were based on biological and economic considerations. Equity issues of concern to the government dealt primarily with initial allocation of quota, security of access for ITQ holders and financial assistance to facilitate restructuring. Several social implications were anticipated as a result of ITQs, such as the concentration of quota ownership, reduced levels of employment in the harvesting sector and the resulting impacts on fishing dependent communities. However, these concerns did not significantly alter the original design of the ITQ system, except the adoption of a 20 percent concentration limit on quota ownership which was proposed by the industry.

As expected, ITQs have had a significant social impact. First, there has been a trend towards a concentration of quota in the hands of larger quota holders, particularly fishing companies. "At the end of February, 1988, the ten largest quota holders appear to have owned or leased about 66 % of the total quota... This level of holdings was up from the corresponding figures in early June, 1987. At that time, about nine months into the program, the ten largest quota holders owned or leased about 58 % of the total quota."[14] In some instances, companies have reached the 20 percent limit applied to species/area ITQ holdings.

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[14] Muse, B. and K. Schelle. 1988. New Zealand's ITQ Program. pp. 37.

Second, MAF initially believed that tonnage ITQs would provide more stability for quota holders than ITQs based on a percentage of the TAC. This view has changed. "It now seems clear that a percentage TAC would confer more stability on the industry, since under the tonnage system there is no guarantee that when an increase follows a decrease, people will be successful in reobtaining former losses in the tender."[15]

Also, industry representatives are concerned about the high cost facing individuals wanting to enter the fishing industry. Some fishermen thought that the cost of buying quota would be prohibitive for many potential fishermen.

3.4 Administration and Enforcement

3.4.1 Administration

Quota management has entailed significant changes for both MAF and the fishing industry -- establishing TACs, allocating ITQs, a quota buyback program, a catch reporting and quota monitoring system, a quota exchange, an overhaul of the enforcement system and ongoing attempts to correct problems that arise. Normal adjustment difficulties were experienced, such as morale problems at MAF that accompanied large scale layoffs in the area of enforcement, and industry complaints about the demands of the catch monitoring system. However, two years into ITQ management there were very few complaints about the administrative system, with the exception of the delays in settling appeals concerning initial allocations. There were about 1,100 appeals to the Quota Appeal Authority and only about two-thirds of those appeals had been heard after two years of ITQ management.

One noteworthy positive consequence of ITQ management on administration was the resolution of conflict among fishermen. Before ITQ management was introduced, it was common to have disputes among fishermen over regional or gear specific fishing restrictions. Such restrictions had the effect of limiting the fishing activities of one group of fishermen relative to others and therefore had the potential to alter catch shares. ITQ management resolved these disputes by establishing explicit catch shares and by providing a market mechanism to adjust catch shares in the future (i.e. quota transferability).

3.4.2 Enforcement

MAF officials are generally satisfied with the enforcement of ITQs to date. The enforcement system is based on an elaborate reporting process to ensure that ITQ holders do not catch more fish than they are entitled to, "reverse onus" legislation[16], and severe penalties for violators. During the first year and a half under ITQ management, the emphasis was on instituting formal documentation and reporting procedures to keep track of quota holding and catches. Subsequently, systems have been developed to evaluate, test and analyze the

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[15] Clark, I.N., P.J. Majors and N. Mollett. 1988. pp. 348

[16] Reverse onus forces a person suspected of committing an infraction to prove his innocence rather that the normal practice of the crown proving guilt.

information. The courts are increasingly showing that they are willing to impose severe penalties. Recent decisions have involved forfeiture of quota and boats. The first big seizure was in 1989 when a fishing company lost $NZ 4 million worth of quota and boats following conviction for deliberate overfishing (i.e. fishing without quota). In 1990, a vessel valued at $NZ 650,000 was forfeit to the Crown.

One weakness in the enforcement system identified by MAF was its concentration on ITQ holders. In particular, a poacher who does not hold any quota does not face the possibility of losing his ITQ -- a significant deterrent for quota holders.

Industry representatives were less satisfied with enforcement. There was a general belief within the industry that enforcement of ITQs was not adequate. Concern was expressed over the removal of fisheries officers from remote areas and the lack of presence generally "on the docks". While quota holders thought that the penalties for illegal fishing were severe, for some the perception of being caught was quite low. Industry representatives also noted that people who do not hold quota have less to lose if convicted of fishing illegally. Several people interviewed believe that inadequate enforcement has resulted in a substantial black market.

It is very difficult to estimate how much fish is being caught illegally. It appears that the black market is limited to a small portion of domestic sales which accounts for about 20 percent of total fish sales (i.e. about 80 percent of New Zealand's fish landings are exported).

4. LESSONS FROM NEW ZEALAND'S EXPERIENCE WITH ITQs

Given the high level of support for ITQ management, from both the fishing industry and MAF, it would be useful to examine the factors that contributed to this commitment.

A Clear Vision - New Zealand's vision of the future for the fishery centered primarily on allowing fish stocks to recover from overfishing, creating an economically viable commercial fishing industry and preserving a recreational fishery. The vision was expressed in terms of two objectives -- to achieve the long term continuing maximum economic benefits from the resources and to preserve a satisfactory recreational fishery. These objectives provided guidance in designing a fisheries management program. In contrast, objectives for managing Canada's commercial fisheries seek more of a balance between economic and social interests. While the vision of future fisheries management in Canada does not have to be the same as New Zealand's, it would be helpful to have a clear statement of objectives to guide fisheries management in Canada.

A Comprehensive Plan - ITQs represent a major departure from the traditional fisheries management approach followed in New Zealand and therefore required sweeping changes in government operations and the rules governing the fishing industry. A comprehensive plan was developed to facilitate the changes which included amendments to the Fisheries Act, a government funded quota buyback program, a quota monitoring and reporting system, a quota trading exchange and a system of collecting resource rentals.

An Effective Consultation Strategy - MAF officials recognized that a high degree of industry support was needed if ITQs were to be successfully implemented. The consultative process was described by participants as "long, exhausting, detailed, and thorough."[17] The most visible parts of the consultative process involved the preparation of the "Blue Book" (i.e. a discussion paper titled Inshore Finfish Fisheries: Proposed Policy for Future Management) and a series of public meetings. In total, there were about 65 public meetings held over a two month period late in 1984 and early in 1985.

Another element of the consultative process was early contact with key industry leaders. In small informal meetings, key industry spokesmen became familiar with the concept of ITQs and the likely impacts of such a management system. Subsequently, the input of industry leaders at public meetings was considered important in gaining the support of the majority of New Zealand fishermen.

Political Commitment - The government's general economic reform strategy included the intention to bring market forces to bear in the realm of fisheries management. "The government initially had some difficulty in accepting that the introduction of property rights into the fishery constituted a market solution, but after acceptance the concept was grasped firmly and supported strongly."[18] Strong government support was needed to implement the legislative and administrative changes.

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[17] Clark and Duncan. pp. 131

[18] Clark, Major and Mollett. pp. 327

The Desire and Ability to Change the Administrative Structure -The introduction of ITQs required a fundamental change in the fisheries management administrative structure. The emphasis shifted from restricting inputs (e.g. number of vessels, fishing gear and number of fishing days) to directly restricting output (i.e. the quantity of fish caught). New functions associated with monitoring landings and quota trading were needed while old duties linked with controlling fishing effort were no longer relevant. In response to the changing demands, MAF underwent some significant restructuring. For example, about 40 percent of the surveillance and enforcement staff was laid off, many others were retrained and new employees -- accountants and ex-police offices with experience in fraud investigations -- were hired.

A Strong Legislative Base - ITQ management required an overhaul of the Fisheries Act. Amendments to the Fisheries Act enabled the introduction of very restrictive quota monitoring and enforcement provisions which were considered essential to the success of ITQ management. Elements of the legislative package include the authority for auditors to review catch records without a search warrant, reverse onus in proving illegal activity, and severe penalties for offenders. Offenses against the ITQ system are treated not as traditional fishing violations but as commercial fraud.

Financial Investment By Government (Buyback) - Excess fleet capacity relative to available catch had the potential to be a major impediment to the introduction of ITQs. General support for the program would suffer if catches were reduced substantially and fishermen would be under pressure to catch over their quota. Therefore, the government provided restructuring assistance in the form of a quota buyback. In effect, this represented an investment on the part of the government.

In addition to the above steps taken by the government, New Zealand has several important characteristics that contribute to its ability to manage its fisheries successfully using ITQs. First, geographical isolation makes it impractical for domestic vessels to avoid reporting catches by landing in a foreign port. Second, New Zealand's fishing industry is export orientated with about 80 percent of the output destined for export markets. Exports are monitored and compared to the level of landings reported to identify possible discrepancies. Third, the New Zealand government has the jurisdiction to monitor product flow both at sea and on shore. This makes enforcement easier than in Canada where federal and provincial jurisdictions would both come into play. Finally, many of New Zealand's fish species are long lived with fairly stable abundance and therefore amenable to preseason catch quotas. The ability to fix catch quotas, for at least one season, provides the stability necessary to award individual allocations.

The following problems associated with New Zealand's ITQ management also provide direction for those involved in designing ITQ systems elsewhere.

Resource Rentals - Adjusting the level of resource rentals has proved to be one of the most contentious issues between MAF and the fishing industry. When ITQs were implemented, the exact level of future resource rentals was not clear, although the New Zealand government stated it's intention to capture resource rent. However, the practical problems associated with defining and measuring resource rent proved to be significant. No specific formula was established to adjust resource rentals. Instead, adjustments were to be based mainly on the value of ITQ and measures of industry viability. Uncertainty about the level of future resource rentals created a somewhat unstable business environment and led to ongoing confrontations between MAF and the fishing industry. Some of these problems may have been avoided by establishing a formula for adjusting resource rentals, thereby removing much of the uncertainty.

ITQ Entitlement - Given the problems associated with tonnage ITQs, it appears that allocating ITQs as a percentage of the TAC has many advantages.

Quota Appeals - Long delays in settling quota appeals have generated some hard feelings and could be avoided with a concerted effort to resolve appeals quickly.

Enforcement - New Zealand's catch monitoring and enforcement system was developed to control quota holders effectively. It soon became apparent that the system had to address potential problems of illegal fishing by individuals who do not hold quota.

High Grading and Bycatch Dumping - In New Zealand, it was recognized before ITQs were introduced that high grading and bycatch dumping would be difficult issues to overcome. Various measures have been implemented in an effort to reduce these problems but high grading and bycatch dumping still occurs. As a result, it can be concluded that there are no obvious solutions to these problems.

5 CONCLUSION

The extensive use of ITQs in managing New Zealand's fisheries is unique. While many countries have experimented with individual quotas over the past ten years, New Zealand has adopted ITQs as its mainstream approach to fisheries management. The move to ITQs has had a significant impact on both the government and the fishing industry.

Overall, there is strong support for ITQs and a belief that the benefits of ITQ management outweigh the problems. This view is shared by both government and industry. Specific problems have emerged and modifications to the original program have been made. In addition, efforts continue to be made to find solutions to other problems, such as bycatch dumping.

New Zealand's experience with ITQs provides a number of valuable lessons for other countries interested in ITQ management. No doubt, New Zealand's ITQ management will continue to attract the interest of fishing nations around the world for many years to come.

Postscript

This paper has not dealt with Maori fishing claims. However, it should be noted that the biggest single issue facing the New Zealand fishing industry is the Maori claim for a greater share of the fisheries resource. The introduction of ITQs was, in part, responsible for bringing Maori claims to the forefront and the resolution of claims with respect to the fishery could have a profound impact on the future management of New Zealand's fisheries.

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